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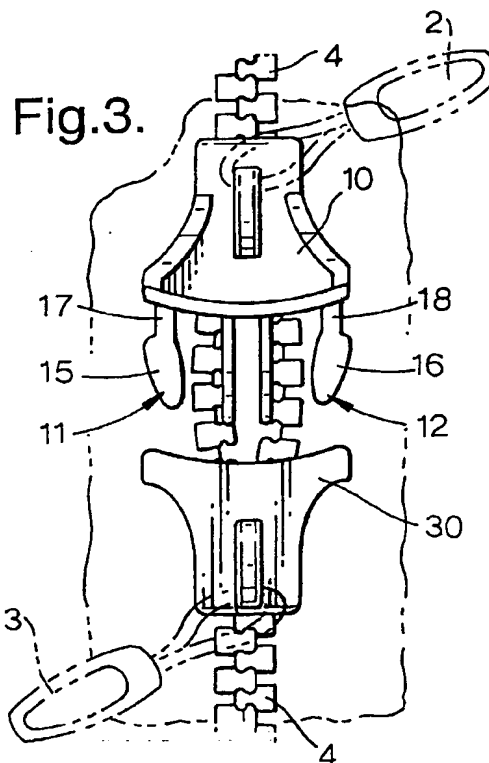
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(54) A slide fastener

(57) A slide fastener (1) is provided which has two sliders (10, 30) arranged to be slidable on a pair of interlocking stringers (5, 6) so as to open the fastener (1) when separated and close the fastener (1) when brought together, at least one receiving portion (31, 32) disposed on one of the sliders (10, 30), at least one latching member (11, 12) disposed on one of the sliders (10, 30) and engageable with the receiving portion (31, 32). The sliders (10, 30) engage and are separated by deformation of the receiving portion (31, 32) and/or the latching member (11, 12).



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Description

[0001] The present invention relates to slide fasteners or sliding clasp fasteners, in particular, but not limited to slide fasteners for bags and garments.

[0002] More particularly, the invention relates to slide fasteners having two moveable sliders such that the fastener may be opened at any point along its length.

[0003] Slide fasteners of the above type are well known in general. However, there is a tendency for the sliders to accidentally separate, so opening the fastener. In order to overcome this problem, different lockable fasteners have been suggested. However, these must have mechanisms which allow the locking to take place, and these mechanisms are often very complicated, requiring many parts in each slider.

[0004] Therefore, a need for a simpler fastener which hinders accidental separation of the sliders is seen.

[0005] It is therefore an object of the present invention to remove or ameliorate at least one of the disadvantages of the prior art.

[0006] According to a first aspect of the invention there is provided a slide fastener comprising a first slider and a second slider arranged to be slidable on a pair of interlocking stringers so as to open the fastener when separated and close the fastener when brought together; a first receiving portion disposed on the first slider; a first resilient latching member disposed on the second slider and engageable with the first receiving portion; a second receiving portion disposed on one of the sliders; and a second resilient latching member disposed on the other of the sliders and engageable with the second receiving portion; wherein the first and second receiving portions are arranged to engage with the first and second latching members respectively, to releasably latch the first and second sliders together, and the latching members and receiving portions are arranged to be disengaged by lateral movement of the latching members, so unlatching the sliders.

[0007] The relative lateral movement of the latching members may be caused by movement of the sliders along the axis of the fastener. It may also be caused by manipulation of the latching members by a user.

[0008] Preferably, the first and second latching members and first and second receiving portions are arranged to be spaced laterally from the centre of the first and second sliders.

[0009] Preferably, the first and second latching members are elongate external protrusions. Also preferably, the latching members enter one or more recesses in the corresponding slider to engage the receiving portions. These features mean that the latching members are retained at least partially inside the sliders when engaged so reducing the probability of fouling of the latching members.

[0010] Preferably, the slide fastener also comprises a lead member on one of the sliders; a guide portion on the other slider, the guide portion arranged to guide the

lead member when the first and second sliders are brought together, wherein the lead member and guide portion align the first and second sliders and inhibit lateral movement therebetween. An advantage of this is that the first and second sliders are aligned to allow the latching members to engage with the receiving portions. Additionally, inhibiting lateral movement between the sliders reduces the likelihood of accidental separation of the sliders.

[0011] Preferably, the lead member is located between the latching members. This arrangement allows a central lead member with the latching members engaging laterally disposed receiving portions.

[0012] According to a second aspect of the invention there is provided a slide fastener comprising a first slider and a second slider arranged to be slidable on pair of interlocking stringers so as to open the fastener when separated and close the fastener when brought together; a resilient latching member disposed on the first slider; a receiving portion disposed on the second slider and arranged to engage the latching member such that when engaged, the latching member and receiving portion inhibit separation of the first and second sliders; a lead member on one of the first and second sliders; a guide portion on the other slider, arranged to guide the lead member when the first and second sliders are brought together, wherein the lead member and guide portion align the first and second sliders and inhibit lateral movement therebetween.

[0013] Preferably, the lead member comprises an elongate external protrusion on one of the sliders. This facilitates guiding of the sliders into relative alignment when they are brought together.

[0014] Preferably, the guide portion is within one of the sliders. This allows the two sliders to be brought completely together so that there is substantially no gap between the two sliders when they are latched.

[0015] Preferably, there are two lead members. This allows more positive engagement of the guide portion.

[0016] Preferably, the opposing faces of the sliders are curved and of complimentary shape for engagement. This ensures there is no substantial gap between the sliders when they are latched.

[0017] Preferably, at least one of the sliders is formed as an integral single piece. This reduces working and manufacturing costs. The piece may be formed by die casting or injection moulding, or any other suitable method.

[0018] In a further aspect of the invention, the slide fastener comprises a first slider and a second slider arranged to be slidable on a pair of interlocking stringers so as to open the fastener when separated and close the fastener when brought together, the first slider comprising two latching members adjacent respective sides of the first slider, the arrangement being such that the two sliders clip together by the engagement of the latching members with the second slider and, when clipped together, respective outside lateral zones of the latching

members are accessible so that the sliders can be unclipped by squeezing the latching members towards each other.

[0019] An embodiment of the invention will now be described, purely by way of example, with reference to the accompanying drawings in which:

Figure 1 is a top view of a slide fastener in accordance with the invention, with two sliders engaged on two toothed stringers;

Figure 2 is an underneath view of the slide fastener with the sliders engaged;

Figure 3 is a top view of the slide fastener with the sliders disengaged;

Figure 4 is an underside view of the sliders detached from the stringers;

Figure 5 is a top plan view of the sliders detached from the stringers;

Figure 6 is an end view of one of the sliders;

Figure 7 is an end view of the other slider;

Figure 8 is a rear end view of one of the sliders;

Figure 9 is a rear view of the other slider;

Figure 10 is a side view of the sliders;

Figure 11 is a section through plane X-X shown in Figure 10, but showing both sliders clipped together;

Figure 12 is a section through plane XI-XI shown in Figure 5, through the female slider; and

Figure 13 is a section through plane XII-XII shown in Figure 5, through the male slider.

[0020] Figure 1 shows a slide fastener 1 comprising a first slider 10, a second slider 30 and a zip 4 (the word "zip" as used herein means a fastening mechanism having stringers which interlock by means of teeth). The zip 4 comprises first and second toothed stringers 5, 6, which are joined and separated by the first and second sliders 10, 30. Additionally, two grasping means 2, 3 are provided in the form of profiled knobs, one on each of the sliders, to pull the sliders along the zip 4. The sliders 10, 30 each have an engaging end which contacts with the other slider, and an outer end which is opposite to the engaging end.

[0021] Figure 2 shows the underside view of the slide fastener 1, which again shows the first and second sliders 10, 30 and the zip 4. The sides shown in Figure 1

will generally be placed on the outside of the bag, garment or other article to which the slide fastener 1 would be attached and the side shown in Figure 2 would be on the inside.

5 [0022] Figure 3 shows the slide fastener 1 with the first and second sliders 10, 30 in a non engaged position. In the region between the two sliders, the first and second stringers 5, 6 are separated; in the region outside the sliders 10, 30 the two stringers 5, 6 are interlocked to close the fastener 1.

10 [0023] The first and second sliders 10, 30 have a standard arrangement for separating and joining the interlocking stringers 5, 6. A divider 25, 45 connects a base 28, 48 to the main body of the slider 10, 30 and this base has a lower retaining flange 27, 47 on the lateral edges of the base 28, 48, which points towards the main body. The base 28, 48 widens laterally from the outer end of the slider 10, 30 to the engaging end. An upper retaining flange 26, 46 is situated on the main body of each slider 10, 30 and follows the same contours in the plane of the zip 4 as the lower retaining flange 27, 47. The flange, 26, 27, 46, 47 flexes the stringers 5, 6 of the zip 4 outwards laterally and urges the interlocked teeth apart. The divider 25, 45 acts to separate the stringers 5, 6 on the engaging side of the sliders 10, 30. The interlocking mechanism works in the same way to conjoin the two stringers 5, 6, except in reverse.

15 [0024] The interlocking mechanism of the sliders 10, 30 is independent of the base 28, 48 and divider elements 25, 45, which act to separate and join the teeth of the stringers 5, 6 of the zip 4.

20 [0025] Figure 5 shows the first and second sliders 10, 30 removed from the zip 4 and separated.

Figure 5 shows first and second latching members which, in this embodiment are arms 11 and 12, and first and second lead members 13, 14 arranged on the first slider 10. The first and second arms 11, 12 and the first and second lead members 13, 14 protrude from a curved abutting surface 20 on the engaging end of the first slider 10.

25 [0026] Each arm 11, 12 has a neck portion 17, 18 adjacent the abutting surface 20 and a head portion 15, 16 distal to the abutting surface 20. The neck portions 17, 18 are resiliently deformable. The whole arm 11, 12 is made from the same material, so that the whole arm 11, 12 is resiliently deformable but the decreased width of the arm at the neck 17, 18 has the effect that most of the deformation occurs in the neck 17, 18. Alternatively, the head 15, 16 and neck 17, 18 portions could be made of different materials. For example, the head could be made to be resiliently flattenable laterally and the neck 17, 18 kept rigid, which would achieve the same effect.

30 [0027] Arranged on the top of the first slider 10 is a loop 21 for attaching the grasping means 2.

35 [0028] The second slider 30 also has a loop 41 for attaching grasping means 3. The second slider 30 has an abutting surface 40 on the engaging end which is complementary in shape to the abutting surface 20 of the first

slider 10.

[0029] As can be seen from Figure 11, the second slider 30 has first and second receiving portions 31, 32 which are disposed laterally on the second slider 30. The receiving portions 31, 32 are rigid and substantially non-deformable, and form vertical members that support the top of the second slider 30; the loop 41 is mounted on the top 36 of the slider 30.

[0030] The second slider 30 has a central cross-piece 35, which is parallel to the top 36. The receiving portions 31, 32, together with the top and central cross-piece 35 define a hole or recess 33. This can also be seen from Figure 11.

[0031] Figure 12 shows a section through the sliders 10, 30 while they are engaged. The arms 11, 12 are engaged with the receiving portions 31, 32. Figure 12 also shows a guide member 34 on the second slider 30. The guide member 34 is arranged centrally, and extends rearwardly, towards the outside end of the slider 30 from a position set back from the hole 33. The amount that the guide portion 34 is set back from the entrance to the hole 33 is not critical, as long as the lead members 13, 14 engage it when the sliders 10, 30 are brought together. Preferably, the lead members 12, 14 engage the guide portion 34 while the arms 11, 12 are still separated from the receiving portions 31, 32. This allows the sliders 10, 30 to be aligned and reduces the possibility of only one of the arms 11, 12 passing into the hole 33, causing fouling of the slides 10, 30.

[0032] The guide portion 34 is elongate, and extends between the top 33 and the centre cross-piece 35. The lead members 13, 14 engage the guide portion 34 laterally, with one lead member extending on either side of the guide portion 34. Alternatively, the guide portion 34 could comprise a central slot, with which a single lead member could cooperate to achieve the same result.

[0033] The guide portion 34 and lead members 13, 14 resist relative lateral movement of the sliders 10, 30, which helps to prevent accidental release of the arms 11, 12 from the receiving portions 31, 32. The elongate nature of the lead members 13, 14 and guide portion 34 also inhibits relative rotational movement of the sliders 10, 30.

[0034] As can be seen from Figure 12, in order to engage the second slider 30 from the non engaged position, the arms 11, 12 must deform inwardly, to allow the heads 15, 16 of the arms 11, 12 to enter the hole 33 and positively engage with the receiving portions 31, 32. As stated above, the arms 11, 12 may deform in several ways in order to accomplish this. The important requirement is that the arms 11, 12 deform when they come into contact with the receiving portions 31, 32 so that they can pass into the hole 33 and then resume their default shape to engage the receiving portions 31, 32.

[0035] The arms 11, 12 deform and enter the hole 33 in the second slider 30. The dimensions of the neck 17, 18 and receiving portions 31, 32 is such that the depth of the receiving portions 31, 32 is slightly less than the

length of the neck 17, 18. In addition, the lateral spacing of arms 17, 18, heads 15, 16 and receiving portions 31, 32 is such that the heads 15, 16 extend laterally outward of the internal surface of the receiving portion 31, 32, and the lateral distance from the centre of the slider of the outside surface of the neck 17, 18 is slightly less than that of the internal surface of the receiving portion 31, 32. In this way, the heads 15, 16 pass the receiving portions 31, 32 and return to their undeformed configuration substantially as the abutting surfaces 20, 40 of the engaging ends abut. The tolerances of these dimensions are important, in that the necks 17, 18 must be sufficiently longer than the receiving portions 31, 32 to allow the arms 11, 12 to return to their undeformed configuration.

[0036] Alternatively, the arms 11, 12 could be rigid, and the receiving portions could be resiliently deformable inwardly. The hole 33 is partially maintained in shape using guide portion 34 to act as a strut.

[0037] The tail portion of the heads 15, 16, i.e. that nearest the neck 17, 18, is squared. Alternatively, the tail portion may be tapered or sloped from head 15, 16 to neck 17, 18. In the latter cases, the engagement with the receiving portion 31, 32 is not so positive, and the resistance to separation of the sliders 10, 30 is lower. In addition, the amount that the head 15, 16 extends laterally beyond the neck 17, 18 can be varied to vary the resistance to separation of the sliders 10, 30. The greater the overhang, the more secure the engagement. The width of the arm head 15, 16 cannot be larger than the lateral distance between the outside of the lead member 13, 14 and the inside of the receiving portion 31, 32, or the arm head 15, 16 will abut the lead member 13, 14 without deforming sufficiently to allow the arm 11, 12 to pass into the hole 33 and engage with the receiving portion 31, 32.

[0038] In order to release the sliders 10, 30 from engagement, the arms 11, 12, must be deformed at substantially the same time. If only one arm 11 is deformed inwardly, then the lateral movement will not be transferred to the second arm 12 due to the inhibition of lateral and rotational movement of the lead members 13, 14 relative to the guide portion 34. Therefore, both arms 11, 12 must be deformed inwardly at substantially the same time in order for the arms 11, 12 to be disengaged and the sliders 10, 30 separated. Such lateral movement can be achieved by squeezing the heads 15, 16 of the arms 11, 12 with finger and thumb, and separating in the sliders 10, 30.

[0039] If the tail portions of the heads 15, 16 are sufficiently inclined, then such pinching of the heads 15, 16 is not required, and simply pulling the two sliders 10, 30 apart with sufficient force will separate them. The sliders 10, 30 will still resist accidental separation, but will separate in response to a strong longitudinal force.

[0040] Alternatively, the tail of the head portion 15, 16 and the part of the receiving portion 31, 32 adjacent to it could have complimentary engaging formations on

them, such as a ridge and groove (not shown). These would then act as further resistance to separation, as the ridge and groove would interlock and resist inward deformation of the head portions 15, 16. Extra force would then be required to deform the arms 11, 12 and separate the sliders 10, 30, which would further lower the possibility of accidental separation, while ensuring that engaging the sliders 10, 30 did not require undue effort as the resilience of the arms 11, 12 would not be affected. Preferably, the neck would be longer than the depth of the receiving portion in this case, so that the heads 15, 16 could return to their non-deformed configuration without interference from the complimentary engaging formations. Then, when the sliders 10, 30 were pulled apart, the complimentary engaging formations would interlink.

[0041] The sliders 10, 30 may be formed in a single piece, so greatly reducing manufacturing costs and complexity of the fastener.

[0042] The forming may be achieved by diecasting, in which case, the material used will be suitable for diecasting - e.g. iron, steel, or tin. Any other suitable material could also be used.

[0043] Alternatively, the forming may be achieved by injection moulding using a suitable plastics material. Any other suitable method of forming would be also appropriate.

[0044] Although the above embodiments of the slide fastener relate to a zip fastener embodiment, it will apply equally to any other type of slide fastener and it should be appreciated that further modifications and variations will suggest themselves to those versed in the art upon making reference to the foregoing description, which is given by way of example only and which is not intended to limit the scope of the invention.

[0045] The present invention has been described above purely by way of example, and modifications can be made within the spirit of the invention. The invention also consists in any individual features described or implicit herein or shown or implicit in the drawings or any combination of any such features or any generalisation of any such features or combination, which extends to equivalents thereof.

[0046] Unless the context clearly requires otherwise, throughout the description and the claims, the words "comprise", "comprising", and the like, are to be construed in an inclusive as opposed to an exclusive or exhaustive sense; that is to say, in the sense of "including, but not limited to".

Claims

1. A slide fastener comprising:

a first slider and a second slider arranged to be slidable on a pair of interlocking stringers so as to open the fastener when separated and close

the fastener when brought together;
a first receiving portion disposed on the first slider;
a first resilient latching member disposed on the second slider and engageable with the first receiving portion;
a second receiving portion disposed on one of the sliders; and
a second resilient latching member disposed on the other of the sliders and engageable with the second receiving portion;

wherein the first and second receiving portions are arranged to engage with the first and second latching members respectively, to releasably latch the first and second sliders together, and the latching members and receiving portions are arranged to be disengaged by lateral movement of the latching members, so unlatching the sliders.

2. A slide fastener according to Claim 1, wherein the relative lateral movement of the latching members is caused by manipulation of the latching members by a user.
3. A slide fastener according to claim 1, wherein the relative lateral movement of the latching members is caused by movement of the sliders along the axis of the fastener.
4. A slide fastener according to any of Claims 1 to 3, wherein the first and second latching members and first and second receiving portions are arranged to be spaced laterally from the centre of the first and second sliders.
5. A slide fastener according to any preceding claim, wherein the first and second latching members are elongate external protrusions.
6. A slide fastener according to any preceding claim, wherein the first and second latching members enter one or more recesses in the other slider to engage the receiving portions.
7. A slide fastener according to any preceding claim, wherein the first and second receiving portions are rigid.
8. A slide fastener according to any preceding claim, further comprising:

a lead member on one of the sliders;
a guide portion on the other slider, the guide portion arranged to guide the lead member when the first and second sliders are brought together, wherein the lead member and guide portion align the first and second sliders and in-

hibit lateral movement therebetween.

with reference to the accompanying drawings.

9. A slide fastener according to Claim 8, wherein the lead member is located between the latching members.

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20. An article of luggage, comprising a slide fastener according to any of the preceding claims.

10. A slide fastener comprising:

a first slider and a second slider arranged to be slidable on a pair of interlocking stringers so as to open the fastener when separated and close the fastener when brought together;

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a resilient latching member disposed on the first slider;

a receiving portion disposed on the second slider and arranged to engage the latching member such that when engaged, the latching member and receiving portion inhibit separation of the first and second sliders;

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a lead member on one of the first and second sliders;

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a guide portion on the other slider, arranged to guide the lead member when the first and second sliders are brought together, wherein:

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the lead member and guide portion align the first and second sliders and inhibit lateral movement therebetween.

11. A slide fastener according to Claim 10, wherein the wherein the latching member is an elongate external protrusion.

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12. A slide fastener according to any of Claims 8 to 11, wherein the lead member comprises an elongate external protrusion on one of the sliders.

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13. A slide fastener according to any of Claims 8 to 12, wherein the guide portion is within the other slider.

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14. A slide fastener according to any of Claims 10 to 13, wherein the receiving portion is rigid.

15. A slide fastener according to any of Claims 8 to 14, wherein there are two lead members.

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16. A slide fastener according to any preceding claim, wherein the opposing faces of the sliders are curved and of complementary shape for engagement.

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17. A slide fastener according to any preceding claim, wherein at least one of the sliders is formed as an integral single piece.

18. A slide for a slide fastener as claimed in any preceding claim.

55

19. A slide fastener, substantially as herein described

Fig.1.

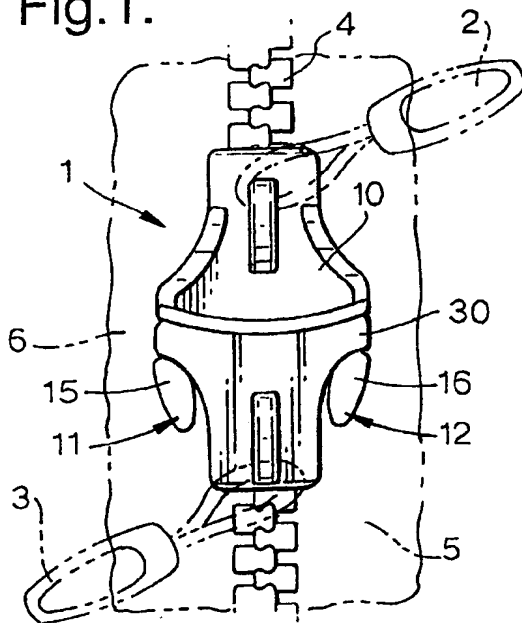


Fig.2.

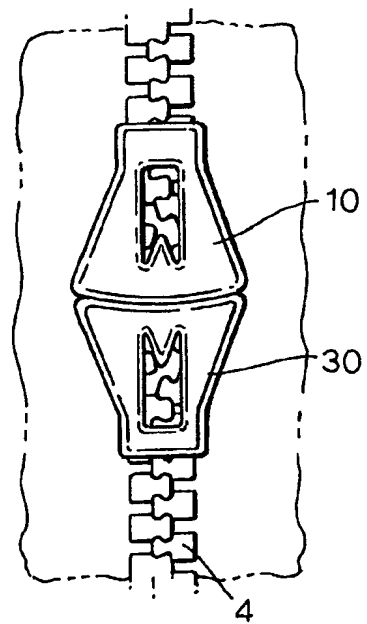


Fig.3.

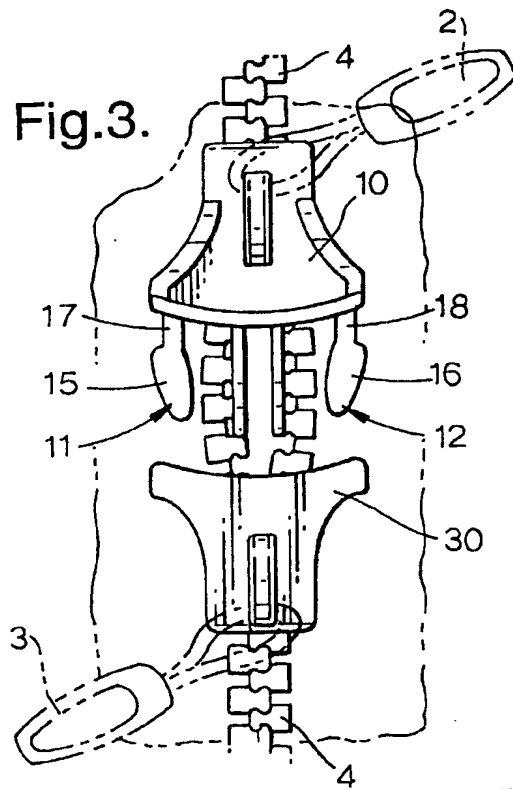


Fig.4.

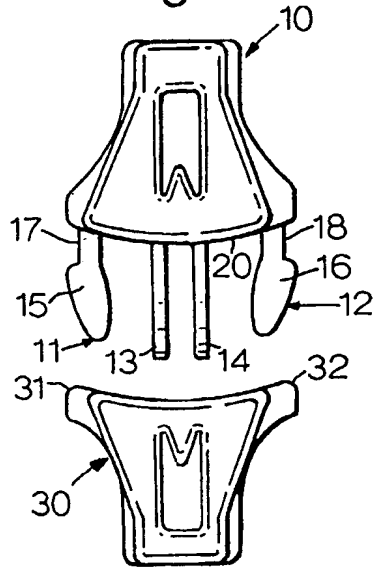


Fig.5.

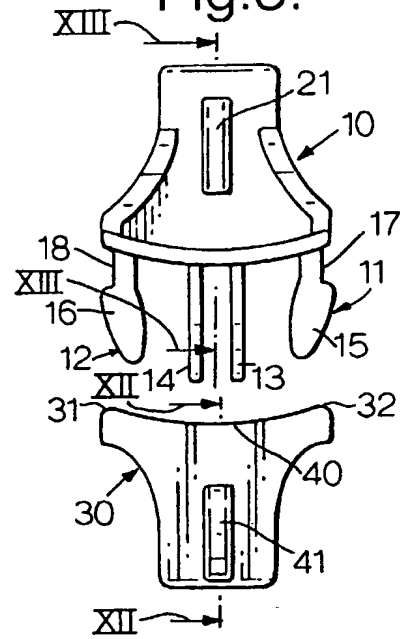


Fig.6.

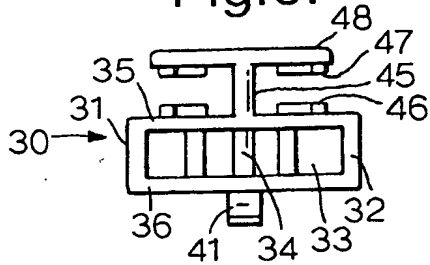


Fig.7.

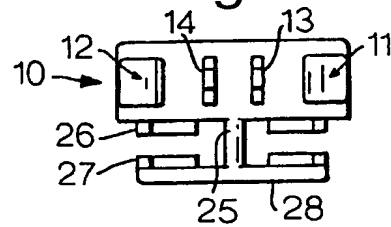


Fig.8.

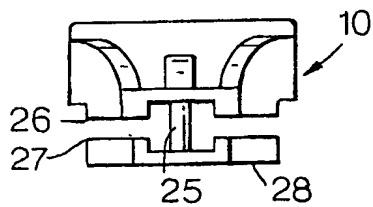


Fig.9.

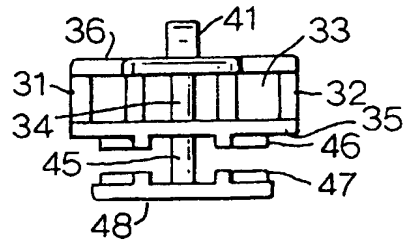


Fig.10.

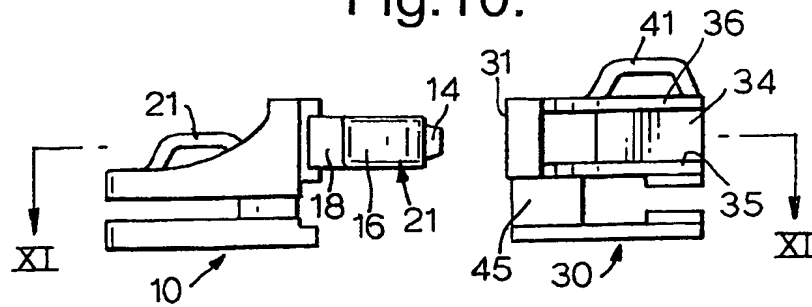


Fig.11.

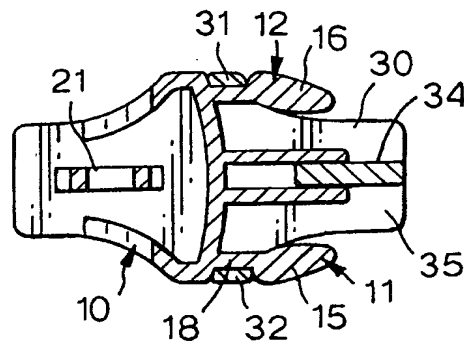


Fig.12.

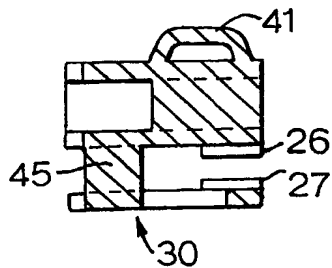
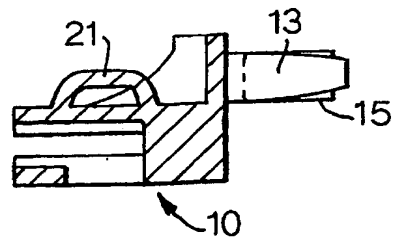


Fig.13.





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 40 2561

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7) A44B
Place of search MUNICH		Date of completion of the search 22 February 2002	Examiner Kock, S
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 40 2561

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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